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For the Advocate of Science.

GEOLOGY, No. 7.

Recapitulation.—Next above granite, are two rocks called *gneiss*, and *mica slate*, composed of the same ingredients, though a smaller proportion of feldspar, and of slaty structure. The mica slate contains hardly any feldspar. They are used as flagstones and curbstones, &c., being easily split into slabs. They sometimes contain the ores of the precious metals. *Primitive limestone* is next in order, a variety of which is statuary marble. It does not exist in very extensive strata. Some geologists have supposed it to have been formed, in common with all limestones, by shellfish; but it is most probably an original formation. Shellfish, however, are known to form great bodies of rock, coral reefs, &c. The *transition* rocks come next, differing from the primary in containing traces of plants and animals, which are supposed to have existed on the earth at the time of the formation of the transition strata. *Clay slate* is the deepest one, composed of *alumine*, the base of clay, and being slaty in structure. It has many useful applications, such as for roofs, writing slates, hones, &c. It is rich in gold, silver, copper, and tin ores. It imparts a pleasant scenery of rounded, fertile hills. *Grauwacke*, or *greywacke slate*, comes next. It is a slaty rock, composed of the fragments of those kinds of rocks which lie beneath. It is the first rock which contains fragments of other strata.

Transition, or *mountain limestone.*—We observed among the primary formations, a calcareous rock, or a rock composed of lime, which contains no trace of animals or vegetables. One of the most important of the transition strata is also a limestone, not so perfectly crystallized as the former, and containing, in greater or less quantity, the relics of ancient marine animals. The term *mountain limestone*, is often applied to it, because it is frequently met with forming the body of mountains.

Caverns and subterranean rivers.—Owing perhaps to the irregular operation of the causes that gave rise to this rock, some parts of it are much softer than the rest. These soft beds being washed out by subterranean streams, occasion excavations and caverns of considerable magnitude. Rivers are sometimes ingulphed in mountain limestone by being precipitated into these caverns, and rise again to the surface of the earth at a distance of several miles. There is a mountain in Derbyshire, England, containing twenty-eight caverns of this kind, called by the natives, *swallow-holes.*

Ores and marble.—Transition limestone contains a large quantity of metallic ore. It also includes most of the beautiful variegated marbles that are disseminated throughout the world.

Historical deductions from the transition strata.—These are the principal rocks of the transition class. It is deeply interesting to the geologist to inquire from what source, and in what manner, originated the vast display of ruins they present to our view, not merely in accidental fragments, or in occasional beds and hills, but in strata covering millions of square miles, and rising frequently even into mountains. The Catskills in New York are conspicuous monuments of geological revolutions. Not only at their base, but at their summit, thousands of feet above the level of the Hudson river, we find these mountains composed extensively of fragmentary rocks, rounded and angular, and the relics of myriads of shellfish; and their massive piles inform us that most of the materials of which they are built were once loose and rolling about, in the waves of the early ocean.

On the other hand, some of the transition rocks have been deposited during a very different state of things; for the plants and animals they contain present, in many instances, few indications, and sometimes not the least trace of violence or of accident. Their most delicate parts are often perfectly preserved;—animals with all their organs entire, and plants with their fibres and leaves as fully expanded as when they opened their verdure and their bloom to the summer's sun, thousands and thousands of years ago. How beautiful and how inevitable is the inference that the little tenants of that primeval ocean, endowed by their organization with scarcely power to move themselves an inch, lived and sported out their day, died and were entombed all within a narrow circle of the spot where we now discover their habitations in the solid rock. What a sublime flight of the imagination to fancy oneself a witness of the grand changes and operations exhibited by the face of nature at that distant day, long, long, before the earth was trodden by the foot of man—when yet the surface of our planet was one wide waste of waters—when the creation of life had just begun, and the first link only in the chain of animated existence had been formed.

Secondary class.—Leaving the transition formations, we will now examine the secondary class. These differ from the former, as a class, principally because they abound more in vegetable and animal remains, showing that the earth was densely peopled both with plants and animals, at the time the strata were deposited.

Their general character.—The secondary rocks are still less crystalline than the transition, many of them being composed entirely of the ruins of the older strata. The deepest of them vary in position as the formations beneath do, having been disturbed from their original horizontal situation by the causes which protruded mountains. But the uppermost of the secon dary class are nearly horizontal, showing that they were made after the elevation of the mountains, and that, since their formation, the superficial portion of our globe has not been extensively deranged by causes similar to those which previously operated.

The coal formation.—The deepest formation of much importance belonging to the secondary series, is that which contains coal. This invaluable mineral occurs in regular strata, or beds, which are separated by layers of different substances. Thus, first perhaps you will find a layer of clay, next one of sandstone, next one of ironstone, then one of slate, and beneath this a layer of coal. Beneath this layer of coal is a floor of slate, next to this a layer of clay, and so on, the same series of strata appearing again till another layer of coal is found.

Coal fields.—The coal formation is distributed over many parts of the world, in patches of no very great extent, appearing to correspond with the beds of ancient lakes in which the deposits seem to have been made. One of these patches, consisting, as before explained, of a number of layers of coal, separated by a much larger number of layers of slate, clay, sandstone, &c., is called a *coal field.*

Spontaneous combustion of coal mines.—The stratum immediately over the coal, is sometimes composed of clay, mixed with a bituminous, or oil-like substance, and iron pyrites, which is a compound of sulphur and iron. This combination is liable to spontaneous inflammation when water comes in contact with it. Coal mines have taken fire in this way, the combustion being propagated to the coal. To such an extent have these subterranean conflagrations sometimes spread, that it has been found impossible to extinguish the combustion. In the north of England, the proprietor of a burning coal mine conducted into it a considerable stream of water, without the least effect. A coal field in Virginia has been on fire for many years, and the soil on the surface above is burnt of a red color, and is so warm as to render it difficult to stand thereon. There is said to be another subterranean conflagration of this nature in Ohio, which has been continually in action ever since the first settlement of the country by the whites. These phenomena are called, from their resemblance to volcanoes, pseudo volcanoes.

Combination of coal with iron.—Coal is almost universally accompanied with ore of iron, a circumstance that adds greatly to the value of both these minerals, and is admirably adapted to subserve the interests of man. To the combination of these two substances, more perhaps than to any other single cause, is owing the

immense power and wealth of Great Britain. With one half of her territory supplied with an inexhaustible quantity of iron ore, and of the materials necessary for its reduction to the metallic state, and its manufacture into implements of a thousand kinds, England has extended her commerce and influence over a great part of the known world. There exists in our own country a fortunate combination of the same materials, destined to enrich our happy land, and competent to render this republic, in wealth and power, first among the nations of the earth.

Profits of coal mines.—Although there are so many separate layers of coal in a coal field, many of them are very shallow, and commonly only two or three repay the expense of the miner.

Fossils in coal.—There exists in connexion with coal a large quantity of the remains of antediluvian plants, which, like the animals we have traced in the transition strata, appear to have acted an important part in the formation of the crust of the earth, and furnish to us a most valuable record of facts concerning the revolutions which transpired during their term of life;—revolutions which were not only fatal to them as individual plants and animals, but which also swept from the earth the entire races of beings to which they belonged. Of the thousands of species of vegetables and animals which are found entombed in the ancient rocks, the prying eye of the naturalist has never been able to detect a single one now living on our globe.

Origin of coal.—Whether coal has a mineral origin, as granite, slate, and other rocks, or whether it is derived from the carbonization of vegetables, is an unsettled point, to which I shall recur in a future number. S.

Flight of the Passenger Pigeon.

COLUMBA *migratoria.*

From Silliman's Journal—By Dr. Hildreth.

THE most remarkable characteristic of these birds is their associating together, both in their migrations and also during the period of incubation, in such prodigious numbers as almost to surpass belief; and which has no parallel among any other of the feathered tribes on the face of the earth, with which naturalists are acquainted.

These migrations appear to be undertaken rather in quest of food, than merely to avoid the cold of the climate; since we find them lingering in the northern regions around Hudson's Bay so late as December; and since their appearance is so casual and irregular; sometimes not visiting certain districts for several years in any considerable numbers, while at other times they are innumerable. I have witnessed these migrations in the Genessee country—often in Pennsylvania, and also in various parts of Virginia, with amazement; but all that I had seen of them were mere straggling parties, when compared with the congregated millions which I have since beheld in our western forests, in the states of Ohio, Kentucky, and the Indiana territory. These fertile and extensive regions abound with the nutritious beech nut, which constitutes the chief food of the wild pigeon. In seasons when these nuts are abundant, corresponding multitudes of pigeons may be confidently expected. It sometimes happens that having consumed the whole produce of the beech trees in an extensive district, they discover another at the distance perhaps of sixty or eighty miles, to which they regularly repair every morning, and return as regularly in the course of the day, or in the evening, to their place of general rendezvous, or as it is usually called, the *roosting place.* These roosting places are always in the woods, and sometimes occupy a large extent of forest. When they have frequented one of these places for some time, the appearance it exhibits is surprising. The ground is covered to the depth of several inches with their dung; all the tender grass and underwood destroyed; the surface strewed with large limbs of trees broken down by the weight of the birds clustering one above another; and the trees themselves, for thousands of acres, killed as completely as if girdled with an axe. The marks of this desolation remain for many years on the spot; and numerous places could be pointed out where, for several years after, scarce a single vegetable made its appearance.

When these roosts are first discovered, the inhabitants from considerable distances visit them in the night, with guns, clubs, long poles, pots of sulphur, and various other engines of destruction. In a few hours they fill many sacks, and load their horses with them. By the Indians, a pigeon roost, or breeding place, is considered an important source of national profit and dependence for that season; and all their active ingenuity is exercised on the occasion. The *breeding place* differs from the former in its greater extent. In the western countries above mentioned, these are generally in beech woods, and often extend in nearly a straight line across the country for a great way. Not far from Shelbyville, in the state of Kentucky, about five years ago, there was one of these breeding places, which stretched through the woods in nearly a north and south direction; was several miles in breadth, and was said to be upwards of forty miles in extent! In this tract almost every tree was furnished with nests, wherever the branches could accommodate them. The pigeons made their first appearance there about the tenth of April, and left it altogether, with their young, before the twenty-fifth of May.

As soon as the young were fully grown, and before they left the nests, numerous parties of the inhabitants, from all parts of the adjacent country, came with waggons, axes, beds, and cooking utensils, many of them accompanied by the greater part of their families, and encamped for several days at this immense nursery. Several of them informed me, that the noise in the woods was so great as to terrify their horses, and that it was difficult for one person to hear another speak without bawling in his ear. The ground was strewed with broken limbs of trees, eggs, and squab pigeons, which had been precipitated from above, and on which herds of hogs were fattening. Hawks, buzzards, and eagles, were sailing about in great numbers, and seizing the squabs from their nests at pleasure; while from twenty feet upwards to the tops of the trees, the view through the woods presented a perpetual tumult of crowding and fluttering multitudes of pigeons, their wings roaring like thunder; mingled with the frequent crash of falling timber; for now the axemen were at work cutting down those trees that seemed to be most crowded with nests, and contrived to fell them in such a manner, that in their descent they might bring down several others; by which means the falling of one large tree sometimes produced two hundred squabs, little inferior in size to the old ones, and almost one mass of fat. On some single trees upwards of one hundred nests were found, each containing *one* young only, a circumstance in the history of this bird not generally known to naturalists. It was dangerous to walk under these flying and fluttering millions, from the frequent fall of large branches, broken down by the weight of the multitudes above, and which in their descent often destroyed numbers of the birds themselves; while the clothes of those engaged in traversing the woods were completely covered with the excrements of the pigeons.

These circumstances were related to me by many of the most respectable part of the community in that quarter; and were confirmed in part by what I myself witnessed. I passed for several miles through this same breeding place, where every tree was spotted with nests, the remains of those above described. In many instances I counted upwards of ninety nests on a single tree; but the pigeons had abandoned this place for another, sixty or eighty miles off towards Green river, where they were said at that time to be equally numerous. From the great numbers that were constantly passing over head to or from that quarter, I had no doubt of the truth of this statement. The mast had been chiefly consumed in Kentucky, and the pigeons, every morning a little before sunrise, set out for the Indiana territory, the nearest part of which was about sixty miles distant. Many of these returned before ten o'clock, and the great body generally appeared on their return a little after noon.

I had left the public road to visit the remains of the breeding place near Shelbyville, and was traversing the woods with my gun, on my way to Frankfort, when about one o'clock the pigeons, which I had observed flying the greater part of the morning northerly, began to return in such immense numbers as I never before had witnessed. Coming to an opening by the the side of a creek called the Benson, where I had a more uninterrupted view, I was astonished at their appearance. They were flying with great steadiness and rapidity, at a height beyond gun shot, in several strata deep, and so close together that could shot have reached them, one discharge could not have failed of bringing down several individuals. From right to left far as the eye could reach, the breadth of this vast procession extended; seeming every where equally crowded. Curious to determine how long this appearance would continue, I took out my watch to note the time, and sat down to observe them. It was then half past one. I sat for more than an hour, but instead of a diminution of this prodigious procession, it seemed rather to increase both in numbers and rapidity; and anxious to reach Frankfort before night, I rose and went on. About four o'clock in the afternoon I crossed the Kentucky river, at the town of Frankfort, at which time the living torrent above my head seemed as numerous and as extensive as ever. Long after this I observed them, in large bodies that continued to pass for six or eight minutes, and these again were followed by other detached bodies, all moving in the same south east direction, till after six in the evening. The great breadth of front which this mighty multitude preserved would seem to intimate a corresponding breadth of their breeding place, which by several gentlemen who had lately passed through part of it, was stated to me at *several* miles. It was said to be in Green county, and that the young began to fly about the middle of March. On the 17th of April, forty-nine miles beyond Danville, and not far from Green river, I crossed this same breeding place, where the nests for more than three miles spotted every tree; the leaves not being yet out, I had a fair prospect of them, and was really astonished at their numbers. A few bodies of pigeons lingered yet in different parts of the woods, the roaring of whose wings was heard in various quarters around me.

All accounts agree in stating, that each nest contains only one* squab. This is so extremely fat, that the Indians, and many of the whites, are accustomed to melt down the fat for domestic purposes, as a substitute for butter and lard. At the time they leave the nest they are nearly as heavy as the old ones; but become much leaner after they are turned out to shift for themselves.

It is universally asserted in the western countries, that the pigeons, though they have only one young at a time, breed thrice and sometimes four times in the same season; the circumstances already mentioned render this highly probable. It is also worthy of observation, that this takes place during that period when acorns, beech nuts, &c. are scattered about in the greatest abundance and mellowed by the frost. But they are not confined to these alone; buckwheat, hemp seed, Indian corn, holly berries, hack berries, whortle berries, and many others, furnish them with abundance at almost all seasons. The acorns of the live oak are also eagerly sought after by these birds, and rice has been frequently found in individals killed many hundred miles to the northward of the nearest rice plantation. The vast quantity of mast which these multitudes consume is a serious loss to the bears, pigs, squirrels, and other dependents on the fruits of the forest. I have taken from the crop of a single wild pigeon, a good handful of the kernels of beech nuts, intermixed with acorns and chesnuts. To form a rough estimate of the daily consumption of one of these immense flocks, let us first attempt to calculate the numbers of that above mentioned, as seen in passing between Frankfort and the Indiana territory. If we suppose this column to have been one mile in breadth, (and I believe it to have been much more,) and that it moved at the rate of one mile in a minute; four hours, the time it continued passing, would make its whole length two hundred and forty miles. Again, supposing that each square yard of this moving body comprehended three pigeons; the square yards in the whole space multiplied by three, would give two thousand two hundred and thirty millions, two hundred and seventy-two thousand pigeons! An almost inconceivable multitude, and yet probably far below the actual amount. Computing each of these to consume half a pint of mast daily, the whole quantity at this rate would equal seventeen millions, four hundred and twenty-four thousand bushels per day! Heaven has wisely and graciously given to these birds rapidity of flight and a disposition to range over vast uncultivated tracts of the earth; otherwise they must have perished in the districts where they resided, or devoured the whole productions of agriculture as well as those of the forests.

A few observations on the mode of flight of these birds must not be omitted. The appearance of large detached bodies of them in the air, and the various evolutions they display, are strikingly picturesque and interesting. In descending the Ohio by myself in the month of February, I often rested on my oars to contemplate their ærial manœuvres. A column, eight or ten miles in length, would appear from Kentucky, high in air, steering across to Indiana. The leaders of this great body would sometimes gradually vary their course, until it formed a large bend of more than a mile in diameter, those behind tracing the exact route of their predecessors. This would continue sometimes long after both extremities were beyond the reach of sight, so that the whole, with its glittery undulations, marked a space on the face of the heavens resembling the winding of a vast and majestic river. When this bend became very great, the birds, as if sensible of the unnecessary circuitous course they were taking, suddenly changed their direction, so that what was in column before became an immense front, straightening all its indentures, until it swept the heavens in one vast and infinitely extended line. Other lesser bodies also united with each other, as they happened to approach, with such ease and elegance of evolution, forming new figures, and varying these as they united or separated, that I was never tired of contemplating them. Sometimes a hawk would make a sweep on a particular part of the column, from a great height, when, almost as quick as lightning, that part shot downwards out of the common track; but soon rising again, continued advancing at the same height as before; this inflection was continued by those behind, who on arriving at this point dived down, almost perpendicularly, to a great depth, and rising followed the exact path of those that went before. As these vast bodies passed over the river near me, the surface of the water, which was before smooth as glass, appeared marked with innumerable dimples, occasioned by the dropping of their dung, resembling the commencement of a shower of large drops of rain or hail.

Happening to go ashore one charming afternoon, to purchase some milk at a house that stood near the river, and while talking with the people within doors, I was suddenly struck with astonishment at a loud rushing roar, succeeded by instant darkness, which, on the first moment, I took for a tornado about to overwhelm the house and every thing around it in destruction. The people observing my surprise, cooly said, "It is only the pigeons;" and on running out I beheld a flock, thirty or forty yards in width, sweeping along very low, between the house and the mountain or height that formed the second bank of the river. These continued passing for more than a quarter of an hour, and at length varied their bearing so as to pass over the mountain, behind which they disappeared before the rear came up.

* The editor of the second edition of Wilson's Ornithology states, that he has been told that this bird lays *two* eggs.

For the Advocate of Science.

Every person who loves knowledge, particularly if he is fond of honey, ought to know something of the habits of bees. They are one of the most curious and interesting objects in nature.

In a community of bees, there are always three ranks or classes of individuals; the first of which, constituting by far the greater number, are working bees. The second class is composed of idlers, or drones, who are rather larger than the workers. These two classes are governed by a queen, who constitutes the third class, and who is still larger than the idlers.

The queen is by far the most important member of the little commonwealth. Her presence seems to inspire the working bees with their chief principle of action. For if a swarm of bees be deprived of their queen, they will refuse to labor, either in the construction of cells, or in the collection of honey. As their industry is directed towards providing their progeny with dwellings, and with food, it is evident that without the queen, on whom the existence of the succeeding generations is to depend, their toil would be of no avail; and hence the great importance of the instinctive foresight with which they are endowed.

In order to illustrate further the relation of the queen bee to her subjects, I will cite an account given by Reaumur. This celebrated naturalist found a queen and several workers, apparently dead from cold. Most of the workers revived, while the queen remained in an inanimate state. The living bees left their dead companions, and, ranging themselves round the mother, who seemed equally dead, began to lick her with their trunks. Presently she exhibited some signs of returning life, when the whole company testified their joy by a humming kind of sound.

Bees appear to possess a means of communicating intelligence or information one to another. If the queen should be suddenly removed from the hive, or killed, those who first make the discovery become much agitated, and leaving their work, traverse the hive to spread the news of the sad calamity. When one of these meets one of its fellows, the knowledge of the fact is immediately imparted by a gentle touch of the trunk of the messenger upon that of the other; when the latter, in its turn, becomes very uneasy, and leaves its employment, evidently in great distress.

Should a strange queen enter a hive already supplied with a mother, the bees immediately secure the stranger in order to make her fight the original queen. Should either one attempt to escape, the workers in an instant interpose to prevent it. But generally there is no necessity for this measure; for as soon as the two queens see each other, they rush to combat, with the utmost jealousy of sex, while the working bees remain mere spectators. The combat is generally fatal to one of the queens, who is pierced by the sting of her antagonist between the rings which compose her abdomen. Immediate death is the consequence of the wound. It sometimes happens that each of the combatants finds herself completely at the mercy of the sting of the other; should this take place, they both let go their hold, and retreat as quickly as possible from a critical situation. The antipathy of the queen bee to her own sex does not end here; for when her offspring are about to leave their cells and assume the perfect form, she examines them, and stings to death every princess which she discovers.

I have before mentioned that the antennæ, or trunks, appear to be the organs by which bees communicate information to each other. When these are amputated, the queen bees lose at once all that mortal antipathy which they before exhibited towards one another. And even the working bees are not able to distinguish their own queen from a stranger.

The celebrated Huber inserted a grating so as to divide a hive into two portions. The bees who were thus deprived of the company of the queen, thrust their antennæ through the grating in search of her, and she, in acknowledgment of their concern, marched over to the grating, and busied herself in consoling the bees on the other side by tapping their feelers with her own antennæ.

Bees appear to enjoy the faculties of smell, taste, feeling, vision, and hearing. Their sense of hearing was supposed by Huber to be very obtuse, as they were not disturbed by the report of a gun; the same acute observer also believed that the common notion that they are brought together by the noise of tin kettles, is erroneous.

The readiness with which these sagacious animals find their way to their hives, is worthy of remark. The honey hunters of New England take advantage of this qualification of the bee, in order to ascertain the direction in which their deposit of honey is to be found. For this purpose they watch the direction in which two or more bees fly, from different places, after loading themselves with honey. By carefully observing towards what point the several tracks converge, they discover very nearly the exact location of the sweet storehouse.

One of the most singular features in the history of the bee is its skill in architecture. What first strikes our view in the examination of a hive, is the arrangement of the cells in combs, each comb containing two sets or tiers of cells, on one set of bases. Hence, a hive consisting of several such combs, it follows that a single entry or passage will answer for two tiers of cells, one on each side of the entry.

The cells are uniform in their shape, being hexagonal, or six sided. Were they square, or circular, or any other shape, they would occupy more space, or a greater quantity of material would be required to build them; for it is ascertained that the hexagonal form combines the greatest possible amount of room, with the least quantity of material.

If the bottoms of the cells were made flat, it is evident that some room would be lost. Hence we find the base of each cell in the form of a pyramid with three sides. Of course the cells on each side of the comb do not correspond precisely with each other. If a pin be stuck through the central point of the base of a cell, it will enter the partition wall of some of the opposite ones.

The angle which the base makes with the walls of the cells is always the same. It was suspected by some naturalist that this inclination of the pyramidal base is such as to economise, as much as possible, space and material. In order to ascertain the fact, the question was put to several mathematicians to calculate what angle would combine the greatest space with the least material. The result of their calculation gave an angle of nearly 109½ degrees; which was found, on measurement to be exactly the inclination of the base of the cell. We should probably be safe in asserting, that not one person in a thousand, the world over, could ascertain this fact either by calculation or experiment, so accurately as the ingenious architect of the honey comb has done.

The wax which forms the material of the cells, is a secretion from the bodies of the bees. Having eaten their fill of honey, they repose in the hive for twenty-four hours; at the end of this time a substance has exuded from the body in little scales, which they pull off and work up with their tongue until a piece of wax is made of it. With this they immediately proceed to build their edifices—not for themselves, however, for they never occupy the dwellings they construct; their labor being entirely designed for their offspring. When they require rest from their work, they suspend themselves from the ceiling of the hive, in bunches, or in festoons, one clinging upon the back of another.

An examination of the cells of the hive soon after their completion, shows that some of them are filled with honey, and others contain the eggs which the queen bee has deposited. In three days the larva makes its appearance in the form of a little worm. Having remained in this state five days, the workers close up the cell with wax, and the grub then spins a coccoon, and changes in three days afterwards into a nymph; and finally comes forth a perfect bee in six days more.

The royal cell, or that destined for the cradle of the infant queen, is made with much more labor and expense than the others, requiring as much wax as would construct 100 or 150 common cells. It, of course, differs in its shape from the rest. Where the community is deprived of its queen by any accident, the bees build several of these royal cells, and carefully place in them eggs which they have removed from the cells of the workers. By feeding the future princess on royal food, which is much more stimulating than the food of the other worms, a perfect queen bee is the result. This is one of the most surprising facts in natural history.

Amongst the working bees, there is always a distinct class, called, in order to indicate their chief occupation, the nurses. These devote most of their time to the management of the young brood. They visit the cells, take care that not more than a single egg shall remain in any one cell, watch with maternal anxiety the helpless product, provide it with a copious

supply of food, and finally, at the proper season, close it carefully in its cell. Here the insect encloses itself in the coccoon, and at length, when arrived at maturity, eats a passage through the door of its cradle, and appears externally. The nurses flock round it and clean it by wiping their antennæ over its head and body, and feed it with honey. Some of them cleanse the cell from which it has just emerged, to prepare it for another occupant. In a few hours the young bee feels the same appetite for labor which inspires its fellows, starts off in quest of honey, selects the proper flowers without any need of assistance, and when well supplied with honey, regains the hive without the least difficulty after its first expedition.

Honey, which forms the principal food, is collected by them from the nectaries of flowers by means of their tongues. They convey it to the hive in their honey bag, a sort of stomach, from which they can disgorge it at pleasure, on reaching their storehouse. Mischievous and cruel boys sometimes rob the industrious insect of its well earned treasure, by tearing off the body of the animal, and sucking the honey bag. A more wanton and inhuman action cannot well be imagined.

Besides honey, bees collect another substance, known by the name of *bee-bread*. This is the fine dust or pollen discharged from the anthers of flowers. The bee rolls itself in the cup of the flower till thickly covered with this dust, which it then removes with hair brushes, one of which each foot is provided with. The pollen is then kneaded into little lumps, and disposed in a kind of pouch, or basket, which is found attached to their hinder legs. This bee-bread is a necessary article of food with the animals; if deprived of it they always die; and no substitute has ever been discovered.

So far from doing injury to flowers by thus rifling them of their honey, the labors of bees are of important service to vegetation. It is essential to the perfection of the seed of a plant, that the pollen of the flower should be diffused so as to come in contact with the pistil in the centre of the flower. In many cases the pistils grow alone in distinct flowers; and here the perfection of the fruit, so far as the pollen is concerned, depends entirely on the action of the wind, or on the labor of bees, which thus transport the fertilizing dust adhering to their bodies, from one flower to another.

Besides the *honey*, and the *bee-bread*, there is a third substance which bees collect from plants, named *propolis*. This is the gummy resinous matter which exudes from the buds of the poplar tree. Huber placed a branch of the poplar tree by the side of the hive, and observed some of the bees collect on it and fill their baskets with this gum. They then returned to the hive, and were met at the door by others, who unloaded them, and stuck the propolis on the ceiling of the hive, between two combs, so as to be convenient to both. A bee then drew out a little thread of the propolis and entered one of the cells; when it came out, the cell was found partially lined with the cement, at its angles; and the work of cementing together the several parts of the cell was completed by several operations.

(*To be concluded in our next.*) B. E. E.

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Fifth Month 16th, 1833.

Philadelphia Academy of Natural Sciences, 5th Mo. 14th, 1833.

Dr. Samuel G. Morton, in depositing the crania of five native Americans, made some interesting remarks on their peculiar shape, and related a number of particulars respecting the Indians. The skulls were of the Chetimachas, Osage, Lenni Lenape, Creek and Shawnee tribes; all of which possess, in a remarkable degree, the flattened occipital region, giving the head a rounded or squared form, and rendering its several diameters nearly equal; while, in a well formed skull of the Caucassian or European race, the length is six and a half inches, and the lateral diameter four and three-fourth inches. He has observed, in the formation of most of the skulls of our Indians he has examined, this remarkable flatness of the occipital bone; at first, he believed it to be wholly artificial, inasmuch as the Indians are known to have been in the practice of regulating the shape of the head according to their fancy, by tying it up in boards in very early infancy; but as this peculiarity is so general, (though it exists in various degrees) he infers that there is a natural flatness of the occiput, which in many tribes is increased by artificial contrivances.

The cranium of a Delaware, or Lenni Lenape, that once powerful tribe, had been sent him, by a friend in Arkansas. He had heretofore supposed this race to be altogether extinct; but his friend informs him that a portion of them is now living in an obscure section of Arkansas, from which place the skull he then had was procured. It appears, that after they had been forced to emigrate from New Jersey, their native country, they settled in Ohio; but they were soon compelled to emigrate the second time; they then went beyond the Mississippi, to the country where they now are.

The skull of an ancient Peruvian, from the ruins of an Indian city near Truxillo, was also shown, and presented the same remarkable flatness of the back of the head, and the consequent rounded form; a fact which corroborates the hypothesis of Cuvier, that the Indian tribes of North and South America are derived from a common stock. The mounds among which this was procured were numerous, and the quantity of bones scattered about in their vicinity, immense. Their antiquity is very great; at the time the Spaniards invaded Mexico, they were to be seen, much in the same condition they are at present, and the natives have no tradition respecting their age. This skull, at a very moderate calculation, may be 500 years old; the great dryness of the climate being favorable to the preservation of human remains.

Answers to Barbara.

"What is the cause of the hazy or smoky state of the sky, in Indian summer?"

This question, like some others which might be propounded, leads us upon debateable ground. A common notion is, that the haze or smoke of our autumnal sky proceeds from the burning of the prairies in the west, and the combustion of other vegetable substances. There needs but little reflection to dissipate this view. We well know that the same appearance often takes place at other seasons of the year, when no such cause is in operation. Witness the present spring, which has furnished us with an atmosphere more smoky than Indian summer itself. To be sure, the forests have been on fire in several places, but the hazy weather preceded those small conflagrations.

We are disposed to ascribe the phenomenon in question to the existence of vegetable exhalations in the air, which undergo some chemical change analagous to combustion, in the elevated regions of the atmosphere. That the haze is essentially smoke, our senses show us, when the hazy atmosphere descends within the range of our immediate observation. Both the nose and the eyes can detect this. Hence, we infer that it is primarily derived from vegetation, as we know of no other probable source. Moreover, when we consider that every plant, every leaf, every blade of grass, in the vast garden of nature, is constantly exhaling vegetable effluvia, more especially in autumn, the conclusion is unavoidable, that the atmosphere of our earth is always largely impregnated with such exhalations.

We have attributed the *smoky* character of those exhalations to a process of carbonization effected in the upper regions of the atmosphere. This process is very often evident to our vision, in its gradual and uniform effect. After a storm, for instance, the day commences nearly or perfectly clear; but a few hours after sunrise the horizon becomes smoky *in its entire circumference*, and the thickening gradually extends till it involves the whole of the visible sky. Not unfrequently the haze thickens into a cloud, and the air is completely cleared by a fall of rain. On the other hand, the haziness is the precursor of dry weather. It is also materially affected by a fall of the barometer. A sea breeze is apt to dissipate it, but it almost invariably continues and increases during the prevalence of a south-westerly current. It vanishes before a high northerly wind. All these circumstances tend to indicate, that the *smoky* character of the exhalations referred to is produced by some *chemi-*

cal process in the elevated portion of the atmosphere. If any of our readers can give us a better explanation, we shall be pleased to hear it.

[The answers to the remaining queries of "Barbara," are unavoidably postponed.—Ed.]

For the Advocate of Science.

As I have become a little curious on the subject of meteorology, I hope you will indulge me with a few more questions.

1. In looking over your table on the weather, I observe the wind very often northerly in the morning, and inclining to southerly in the afternoon. Why is it so?
2. Why does your table exhibit stronger winds in the middle of the day than in the morning and evening?
3. Why does the wind almost always change to northwest when the barometer has fallen very low?
4. Why does a northwest wind nearly always raise the barometer, and a southernly wind sink it!
5. Why does it snow sometimes when the thermometer is above freezing, and at other times rain when the mercury is below freezing?

BARBARA.

For the Advocate of Science.

AMERICAN SCIENCE AND LITERATURE.—No. 2.

In my former essay I promised to demonstrate that the great indifference manifested to scientific pursuits, by the generality of our countrymen, could be very satisfactorily accounted for.

Man is, in many respects, the creature of habit and imitation. In whatever practice he becomes confirmed in his younger years, to that will he tenaciously adhere through the course of a matured existence. His offspring, naturally seeking an example in the life and character of a parent, imbibe the same propensities, and learn to love the same pursuits. Thus are customs perpetuated, whether they be good or bad, from one generation to another.

As with individuals, so it is with nations, who are composed of individuals. National and personal character must necessarily correspond with each other: hence, the affections of individuals become the affections of nations.

It is but reasonable to attribute to the imperfections of education, many of the foibles of human character:—ignoble propensities, misguided judgment, or rather a total absence of judgment, and a reverential regard for trifles. That society has its full share of these, no one will doubt; and the moral wrong they give birth to is equally palpable.

It is but an every day occurrence to hear the members of a household bringing under critical examination the characters and actions of the heroes of their favorite romance, as gravely as though they were sitting in judgment over the destinies of a whole world. What little moral sentiment it contains—which may be fairly likened to the morsel of honey in the flower of the poisonous laurel—they cast aside, to make way for minute and delicate examination of the reputed freaks of their favorite little hobby, Cupid, which important personage was the great nucleus of the mental labors of the Great Unknown, round which he constructed with magic art many great playthings for great people, and stimulated the great passions of little ones.

I am not inclined to cast an unjust stigma on this gifted author, on account of his works of romance; but with many who are much better acquainted with those works than myself, can I confidently say, they never did *me* any good. To be sure, it may have a soothing effect on some occasions to be able to give an affirmative answer to the question of a fashionable friend, who wishes to know if you have perused "Count Robert of Paris," or "Castle Dangerous;" for if you could not, unquestionably would you be disgraced for your ignorance, and sneered at by the enlightened assembly, before which the unfortunate interrogation is made.

It is left, however, for rational judges to say how much greater, and how much more lasting would have been the glory of Scott, had he directed his herculean intellect to the attentive investigation of natural truths. It is a fact, society has received some signal benefits from his labors; the mental taste of millions has been governed by his will, and diverted somewhat from their vitiated course; and round him have moved satellites of various magnitudes, all emulous of the same celebrity that society has awarded to him, and all seeking it in his trodden path. Thus was a heterogeneous mass of writers of all grades and distinctions at once established on the stage of English authorship, whose assiduous exertions were worthy of a far better cause than the paltry one in which they were enlisted. The mania for novels, and romances, and poetry, and every thing but common sense productions, increased to such an extent, that the diligent and observing philosopher, in addition to being without honor in his own land, scarce could find a friend in the wide world to render to him the humble tribute of well earned praise. The United States of America is not here excepted; so intimately are her citizens connected with those of our mother country, both in habits and intellectual taste, that they may be considered as virtually the same people; consequently, whatever general criticisms are suitable to the one, may also be safely applied to the other.

Adducing, therefore, facts to prove the above proposition, I will bring into notice "Barton's Medical Botany," an excellent work, which, for many years after its appearance, did not obtain a sufficient number of subscribers to defray the expenses of its publication. Wilson strove with unremitting labor to accomplish his great and splendid undertaking, and by his individual efforts in coloring his plates, earned in a state of almost utter penury, the sum of 50 cents a day! To the generosity of his bookseller was he indebted for the means of proceeding with his work. Audubon, enlarging on the scheme, after years of unceasing toil, in roaming through untrodden forests, and braving a multitude of dangers, was almost unknown among our countrymen, and reduced to the necessity of seeking, in a foreign land, the wherewithal to publish his discoveries! Silliman, whose faithful labors in the field of science, has endeared him to all who love to contemplate the great fabric of nature, for a period of twelve years, has published one of the first American scientific journals, and oftentimes has his patronage been scarcely sufficient to pay the expenses incurred by the printing.

Let us now direct our attention to the other side of the picture, that the contrast may be seen. "Waldie's Circulating Library," and "The Novelist's Magazine," are the titles of two publications commenced a year ago, or thereabouts. These now have several thousand subscribers each. "The Lady's Book," one of our *standard literary periodicals*, and quite invaluable to a very sensible class of the community, has also a very great number of subscribers. Such works, it seems, obtain patronage without trouble; it comes to them like manna in the wilderness, but not quite from so good a source. I shall hereafter take occasion to discuss the character and influence of them and similar publications; meanwhile, I adhere to my text.

The amount of matter contained in a volume of these works, is very great. That of one of them, the Lady's Book, and by no means the largest of the three, compared with Silliman's Journal, amounts to considerably more than twice the quantity for half the money! the *value* of the matter is not here taken into consideration; so great, it may be seen, is the difference between the price of solid mental labor, and the mere dross of intellect. This difference, as has been plainly demonstrated, is owing to public encouragement being almost totally withheld from the one, and lavished upon the other; for as with works of art, so it is with those of intellect: this may be exemplified by reference to almost any branch of mechanical science. A year or two ago, a new article appeared in the market, highly characteristic of its makers, our brethren of the land of steady habits. This was wooden combs; at the time they first appeared, they retailed at sixpence a pair; now they may be procured at elevenpence a dozen. This reduction in the price is owing to the demand of the article being sufficient to dispose of all the manufacturer could make. This is precisely the case with the generality of our journal writers. Very little or no encouragement being given to those who have wit enough to write sensibly, they will not devote their time to the occupation; the consequence is, their stations are occupied by a class who write by the quantity, regardless of, or without the ability to judge of, the quality of their effusions. They might be termed mechanical writers; for all the attainments necessary for the full and honorable per-

fermance of their avocation, is a small pocket dictionary, and the few first pages of a grammar book. With these useful companions, they imagine they can climb the heights of Parnassus, and be crowned by the Castalides with the wreath of immortality. For, alas! the modern Parnassus of the world is not the abode of common sense! W.

For the Advocate of Science.

A SCIENTIFIC RAMBLE.—No. 2.

Father. Come, my boys, I am now at leisure to join you on our proposed stroll along the creek.

Louis. I shall go this time without persuasion; for, though the rain stopped us before, yet our brief conversation has left me a most unaccountable curiosity to know what can be found in such a place worthy of our notice. This prying, microscopic propensity of the naturalist may be, I must confess, a source of some gratification and amusement. But it is a troublesome employment, and I cannot see its great utility.

John. I hope my brother don't consider it troublesome to see and to think, when so much pleasure is derived from seeing and thinking. You may as well object to eating and drinking because they are troublesome. And as for utility, it is always useful to exercise the intellect. Besides, ignorance of common things makes one appear very awkward.

Louis. Awkward! I know what you mean, John. But, without boasting of my accomplishments, I defy you to catch me in many things really awkward.

John. Guard well your movements, then; for I promise you diligent watching. I will find you some awkward speech in a few minutes, if you talk at all, except about Pelham, Devereux, or Paul Clifford. As to those gentlemen, or any others that never existed, you are more than a match for me, no doubt, in discussing their qualities. Ah! now is my chance. What have you in your hand, Louis?

Louis. I should call this a twig, that is to say, a small branch of the Dogwood tree, containing several showy flowers. But, I dare say, you have some long jaw-breaker as its title. What is there in that speech to set you laughing?

John. Your fine *flowers!*

Louis. Well, then, *inflorescence*, or *fructification*, if you want a more classical name.

John. I am not picking at names, my wise brother! Let me tell you that the tree you have is not yet in bloom. There's one blunder for you.

Louis. What do you call these four large white showy leaves, if they are not the flower?

John. They are no more the flower than a lady's sleeves are the lady herself. They are only floral leaves, and you see within them the cluster of small flowers not yet expanded.

Louis. Really, it is so! How plain it becomes when attentively examined! I confess that I feel a little flat.

Father. Be assured, my son, you have no more need of feeling so than nineteen-twentieths of your fellow creatures. Many a man who would think himself insulted to be supposed deficient in mental cultivation, has looked at the dogwood tree every year of his life, without seeing its flower. The dress is often mistaken for the thing itself—the shadow for the reality. You may learn a valuable lesson from this trifling circumstance.

Louis. I think I shall. My speeches shall be more carefully made hereafter. I shall not betray myself again.

John. We shall soon see. Father, can you explain the use of those floral leaves?

Father. Their uses are not supposed to differ materially from those of other leaves, which you know act as lungs, absorbing air for the proper growth of the plant. The floral leaves, or *bractes*, also protect the flowers, which they enclose during the winter, and which do not expand for a week after nearly every body would pronounce the tree in full bloom. What are you collecting, Louis?

Louis. I have found some wings belonging to an insect that I do not recollect to have seen before. Their owner probably fell a prey to one of these hungry spiders. They are formed like the wings of the house-fly, but the animal must have been ten times larger.

John. Truly, they are quite a prize. Let us search after one of the insects themselves.

Father. You will find the tree over our heads full of them. These singular wings, you observe, grow on this tree, which is a maple.

Louis. Who would have thought it! They appear to be the seeds of the tree. John, you may pencil us down in company, for that blunder. Don't forget to preserve the insect when you find it!

John. I am neither ashamed nor surprised to find myself in an error of this kind; for I do not profess much, and never paid any attention to botany till within a few weeks. I am perfectly aware of my ignorance, and shall be deservedly mortified if I take no pains to learn better.

Father. One who cares not to study nature will be always liable to fall into similar mistakes, and betray his want of observation, of reflection, of useful reading. The subject of your misconception is the seed of the maple tree, attached to an appendage which is destined to aid in its dissemination. By means of the wing, or sail, with which its seed is furnished, this tree may scatter its progeny to a great distance. Nature is very bountiful in similar curious provisions. The greater number of seeds are provided with some facilities of transportation. This ball of down which grows on the dandelion, is the cluster of seeds, each one of which is furnished with a beautiful feather to waft it through the air. The walking oats, or animated oats, has a long beard, which, by its alternate bending and straightening with the changes of the air, enables the seed to creep several feet. Fruits are also instrumental in effecting the same purpose.

Louis. I had supposed the chief use of fruits was as food for animals. How can an apple or a cocoa-nut aid in the dissemination of plants?

Father. The most important end of many fruits is doubtless the sustaining of animals; for the different portions of creation are wisely framed dependant on each other. But several purposes are often accomplished by the same means. The pulp of the apple protects the seed from insects, and also forms a soil in which it may germinate. The cocoa-nut is a boat in which the embryo of the plant may navigate the ocean, and establish colonies in distant countries and islands.

John. I have often noticed seeds with burrs attached to them, which adhere to clothing, cattle, &c. Is this a similar provision?

Father. It is. Other seeds adhere to animals by means of a glutinous substance which surrounds them.

Louis. I remember some years ago, when I was a pupil at a boarding school, my clothes were frequently stuck full of those little burrs. We called them *tell-tales*, because the teachers discovered by them when we had transgressed our prescribed limits. But I never thought of their having any other use.

John. What is the meaning of these little pits in the sand. I have seen them before, but never could divine their nature.

Louis. I will turn naturalist, brother, and tell you what they are—or at least refer you to those children who are approaching us. Don't you remember when you used to help me to work in the sand, and make ovens and such like?

John. I am not satisfied with your explanation; I dare say it will turn out another blunder for you. We will appeal to Father.

Father. I doubt if you or those children could make such regular and mathematical excavations as those. They are the labors of the ant-lion—a clumsy looking, and slow-motioned little animal which has to resort to stratagem for its livelihood. The excavations are, as you observe, about two inches deep, and perfectly circular, with sides as steep as the sand will admit of. They terminate in a point at the bottom. Thus formed, the pit is a complete trap, in the bottom of which the ant-lion lies covered with sand, and his arms wide open to seize any ant or other little animal that should be so unfortunate as to walk over the brim of the hole.

Louis. How large is this formidable animal?—That account sounds very like romance!

Father. He has nearly the form and size of the common wood-louse. But as you seem to suspect my description you shall see for yourself.—Apropos, there runs a little spider. Let us watch him.

Louis. There! he struggles to avoid sliding down, but the sand gives way beneath his feet. He is gone. The sly trapper has him, I verily believe, poor fellow. But he don't show himself.

Father. We will dig him out and examine him. You see now that he thinks himself in danger, he refuses to stir.

Louis. I have dropped him into another pit, the owner of which has grappled him. He probably supposes he has a valuable prize. How they struggle with each other! I am afraid for their lives.

John. I am very curious to know how that dull looking animal manufactures a trap so simple, and yet so effectual as to catch even a nimble ant.

Father. Its plan is very singular. The insect, having chosen a proper spot, lays out an exact circle, and ploughs a furrow, throwing the sand on the outside of the circle. In performing this operation, it travels backwards, using the hinder part of its body as a ploughshare, its foot as a shovel, and its flat head as an implement to pitch the sand out of the furrow, after the foot has loaded it. A succession of furrows, one within the other, completes the excavation. Should a stone impede its progress, the ingenious insect works its way beneath the stone, and then crawls up the ascent with the cumbrous load on its back. After much patience and perseverance, the work is completed, and the insect then takes his station, concealed in the point of the trap, waiting for his prey. Sometimes an ant, after sliding half way down the steep, is able to check its descent, and struggles to escape. In this case, the trapper rouses from his inactivity, and immediately begins to pelt his victim with showers of sand, which soon brings down the unlucky ant. Having sucked its blood, he places the carcase on his head, and jerks it out of the den; then does what repairs are necessary and secretes himself again.

Louis. Who would have conjectured that an ugly little bug is capable of such expedients! Truly, the ant-lion must be foremost among insects.

Father. No, indeed! You will find hundreds equal, if not superior, in their qualities. I have seen several during our walk, quite as interesting; but our time will not permit us to examine them now.

John. The "Natural History of Insects," a number of Harper's Family Library, which my cousin gave me a few days ago, is full of these entertaining histories. If I mistake not, some account is there given of this animal; but I have not yet reached it.

Louis. The ant-lion must be a very rare animal. I have never seen it before.

Father. Not at all. You may discover it by its circular traps, in sandy spots like these, without an hour's walk, at any time from April to November. It is time now, however, to return home. If you desire it, we will repeat our walk shortly.

Louis. I shall be very anxious to do so. I can now see some reason for my brother's partiality for these studies. Our short excursion has opened almost a new world to me.

Father. I am pleased to witness your sensibility to those charms which nature has lavished on all her works. If a partial acquaintance with two or three shrubs or insects, is capable of affording you so much satisfaction, consider the enjoyment which must flow from a wide extension of your knowledge, and of your intercourse with animated nature. Q.

MISCELLANIES.

Indian Character.—The scrupulous regard of the Indians for fairness is sometimes carried to a great extent. Nuttall relates, on credible authority, a *rencontre* which took place between a party of the Arkansas and Chickasaw Indians. The latter, instead of standing their ground, were retreating before the Quapaws, on account of having no ammunition; who, learning the cause of their flight, were determined to obviate the difficulty by inviting the Chickasaws to land on a sand beach of the Mississippi, promising at the same time to supply them with powder for the contest. The Quapaw chief then ordered all his men to empty the contents of their powderhorns in a blanket, after which he made an equal division of the powder, and gave half to the Chickasaws. They then proceeded to the combat, which terminated in the death of ten Chickasaws, and the loss of five prisoners, with the death of a single Quapaw. We know of no parallel case in the history of our most civilized world.

Curious taste.—The Ottomac Indians in Caraccas have a singular propensity for eating clay. That which they are most fond of, and which they select with the greatest care, is the potter's clay, containing 50 per cent. of silica, 40 of alumina, 4 of magnesia, and 1 of iron, exclusive of water. This clay is procured from beds on the banks of the Oronoka and Meta. As it is not every kind which is particularly congenial to their palate, they distinguish the different species by their taste. The earth they make use of in their gastronomy is kneaded into balls of four or six inches in diameter, and roasted before a slow fire till its surface begins to turn red. After being thus cooked, they are laid by for use; and when desirous of eating them, they are dipped in water. Their other food is fish, lizards, and fern roots, when they can get them; but they are so fond of their earthen ware, that they uniformly eat a little after their other food, though different aliments are at their disposal.

Velocity of Flies—Musca *domestica.*—Many of the common actions of insects, which we are accustomed to look upon with indifference, would be considered almost miraculous were they performed by larger animals. And when a railroad car travels at the rate of a mile a minute, people begin to wonder from one end of the world to the other. But this is nothing in comparison with the performance of the innocent and useful little fly, which we are in the practice of immolating by wholesale, through the medium of poisonous mixtures and the like. It will go, at a moderate calculation, 200 feet per minute. Supposing them to be a quarter of an inch long, which is none too little, it results that they travel over a space of 9600 times their own length every minute. Taking the average length of us biped ones at 5½ feet, to be eqnal to the fly, we should be able to go 528,000 feet, or 100 miles per minute!

Michilimakinac.—This island was originally settled by a party of Hurons, under the care of Father Marquette, in 1671. A fort was constructed, and made the rendezvous both of French and Indian traders. When Indians of different tribes, and such as were at war with each other, here met, animosities were suspended, and their intercourse was friendly. In their tradition concerning the name of this island, they say that Michapous, the chief of spirits, tarried there for a long time, and a mountain on the border of the lake which they called by his name, was the place of his abode. Here he first instructed the Indians to make nets for fishing; and when he departed, he left spirits on the island named Imakinakos, and from these it received the name of Michilimakinac.

AGENTS.

New York City—*Isaac T. Hopper.*
Mount Holly, N. J.—*Samuel Bullock.*
Morrisville P. O. Pa.—*Hector C. Ivans.*
Pottsville, Pa.—*Elihu Pedrick.*
Darby, Pa.—*John Sellers Jr.*
Baltimore, Md.—*Joseph Earnest, N.E. corner of Eutaw Street and Carpenter Alley.*
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